

Alfredo first presented his recent spin tracking results for COSY deuteron polarization experiment. By replacing the factor $1 + G\gamma$ with $G\gamma$ for the rf dipole element only, he could reproduce the experimental data very well. Waldo cautioned that a simple replacement of the factor may not be the whole solution. Thomas asked if the factor was also changed for other elements in COSY lattice such as quadrupoles in the spin rotation calculation. Alfredo replied that other elements were still using the $1 + G\gamma$ factor. But it may not be important, as the kicks from quadrupoles are not in resonance in this case.

Haixin presented the potential AGS polarization improvement ratio for various techniques discussed last week. Some of the ratios are based on simulation, and some of the ratio are based on experimental data. Woody questioned if we have any spin tracking done to distinguish the effect of chromaticity (tune spread). The answer is no: we do not turn on sextupoles in our current spin trackings. Kevin asked if the fact that we could not set both chromaticities to zero the same time is understood. Thomas commented that this is due to second order sextupole effect, which probably requires octupoles to correct. This is relevant for modifying β_x near cold snake. Kevin will model the β_x reduction near cold snake with 17th harmonics. From the improvement ratio, it looks that the gain factor is bigger with 14% cold snake, but the level of polarization reached with 14% cold snake is also lower. Before we can push both betatron tunes into the spin tune gap, the cold snake strength is still a compromise between requirements from overcoming vertical and horizontal intrinsic resonances. Thomas suggested to do spin tracking with various cold snake strengths to see if there is any differences in overcoming $36 + \nu$ resonances. To compare with vertical profile data we already have, we will simulate particles with different vertical emittances. Such a profile is due to partial snake resonance, which can not be derived purely from Froissart-Stora formula and spin tracking is needed. The tracking may tell us what percentage of cold snake is adequate for a given beam emittance and also justify lowering the AGS extraction energy. Lowering extraction energy requires at least a significant ramping time (several minutes) of spin rotators in RHIC at injection. Waldo will quantify the requirement. Adding a magnet in AtR (after lowering the energy) is an expensive solution, and definitely not for the coming run.

Haixin